

WE CLAIM:

1. A fuser member comprising a core and a pliant coating on the core, the coating comprising a base cushion layer comprised of a first elastomeric composition and a surface layer comprised of a second elastomeric composition disposed over the base cushion layer, wherein the hardness of the surface layer is equal to or less than the hardness of the base cushion layer.

2. The fuser member of claim 1, further wherein said base cushion layer is comprised of a first polyorganosiloxane composition having a durometer hardness at 25°C of from about 35 to about 80 Shore A and a surface layer is comprised of a second polyorganosiloxane composition having a durometer hardness at 25°C of from about 20 to about 55 Shore A, further provided that the hardness of the surface layer is less than the hardness of the base cushion layer.

3. The fuser member of Claim 2 wherein at least one of said first polyorganosiloxane composition and said second polyorganosiloxane composition is a polydimethylsiloxane.

4. The fuser member of Claim 2 wherein the base cushion layer has a thickness of from about 77 to about 500 mils.

5. The fuser member of Claim 4 wherein the surface layer has a thickness of from about 3 to about 100 mils.

6. The fuser member of Claim 1 wherein the surface layer further comprises a particulate silica filler in an amount of about 10 volume percent or less, based on total volume of the surface layer.

7. The fuser member of Claim 6 wherein the particulate silica filler is present in an amount of about 5 volume percent or less, based on total volume of the fusing surface layer.

8. The fuser member of Claim 7 wherein the particulate silica filler is present in an amount of about 2 volume percent or less, based on total volume of the fusing surface layer.

9. The fuser member of Claim 6 wherein the surface layer further comprises at least one second particulate filler having a thermal conductivity of greater than about 5 BTU/(hr ft °F).

10. The fuser member of Claim 9 wherein the second particulate filler is at least one metal oxide.

11. The fuser member of Claim 10 wherein the at least one metal oxide is selected from cupric oxide, aluminum oxide, tin oxide, iron oxide, or mixtures thereof.

12. The fuser member of Claim 9 wherein the surface layer comprises from about 5 to about 35 volume percent of the second particulate filler based on total volume of the surface layer.

13. The fuser member of Claim 9 wherein from about 15 to 35 volume percent of the second particulate filler, based on total volume of the second particulate filler, is comprised of particles having a diameter greater than 8 microns.

14. The fuser member of Claim 9 wherein from about 10 to about 25 volume percent of the second particulate filler, based on total volume of the second particulate filler, is comprised of particles having a diameter greater than 12 microns.

15. The fuser member of Claim 9 wherein from about 5 to 15 volume percent of the second particulate filler, based on total volume of the second particulate filler, is comprised of particles having a diameter of greater than 20 microns.

16. The fuser member of Claim 1 wherein the coating has an apparent hardness of from about 40 to about 75 Shore A.

17. The fuser member of Claim 1 wherein the second elastomeric composition is a polyorganosiloxane and the surface layer comprises greater than 60 volume percent of the polyorganosiloxane, based on total volume of the surface layer.

18. A fuser member comprising a core and a pliant coating on the core, the coating comprising a surface layer comprised of a first elastomer and a particulate silica filler in an amount of about 10 volume percent or less, based on total volume of the surface layer, the surface layer having a durometer hardness at 25°C of from about 20 to about 55 Shore A.

19. The fuser member of Claim 18 wherein the first elastomer is a polyorganosiloxane.

20. The fuser member of Claim 19 wherein the polyorganosiloxane is a polydimethylsiloxane.

21. The fuser member of Claim 18 wherein the surface layer has a thickness of from about 3 to about 100 mils.

22. The fuser member of Claim 18 wherein the surface layer further comprises a second particulate filler having a thermal conductivity of greater than about 5 Btu/(hr ft F°).

23. The fuser member of Claim 22 wherein the second particulate filler is at least one metal oxide.

24. The fuser member of Claim 23 wherein the at least one metal oxide is selected from cupric oxide, aluminum oxide, tin oxide, iron oxide, or mixtures thereof.

25. The fuser member of Claim 22 wherein the surface layer comprises from about 5 to about 35 volume percent of the second particulate filler based on total volume of the surface layer.

26. The fuser member of Claim 22 wherein from about 15 to 35 volume percent of the second particulate filler, based on total volume of the second particulate filler, is comprised of particles having a diameter greater than 8 microns.

27. The fuser member of Claim 22 wherein from about 10 to about 25 volume percent of the second particulate filler, based on total volume of the second particulate filler, is comprised of particles having a diameter greater than 12 microns.

28. The fuser member of Claim 22 wherein from about 5 to 15 volume percent of the second particulate filler, based on total volume of the second particulate filler, is comprised of particles having a diameter of greater than 20 microns.

29. The fuser member of Claim 19 wherein the surface layer comprises greater than 60 volume percent of the polyorganosiloxane, based on total volume of the surface layer.

30. The fuser member of Claim 18 wherein the coating further comprises a base cushion layer.

31. The fuser member of Claim 30 wherein the base cushion layer is comprised of a second polyorganosiloxane.

32. The fuser member of Claim 31 wherein the second polyorganosiloxane is a polydimethylsiloxane.

33. The fuser member of Claim 30 wherein the base cushion layer has a durometer hardness at 25°C of from about 35 to about 80 Shore A.

34. The fuser member of Claim 33 wherein the hardness of the surface layer is equal to or less than the hardness of the base cushion layer.

35. The fuser member of Claim 34 wherein the hardness of the surface layer is less than the hardness of the base cushion layer.

36. A fusing apparatus for fusing toner images to a receiver medium, the apparatus comprising:

a fuser member comprising a core and a pliant coating on the core, the coating comprising a base cushion layer comprised of a first elastomeric composition and a surface layer comprised of a second elastomeric composition disposed over

the base cushion layer, wherein the hardness of the surface layer is equal to or less than the hardness of the base cushion layer;

a pressure member having a contact surface and positioned adjacent to the fuser member thereby forming a fusing nip there between to receive the receiver medium;

at least one external heater member positioned adjacent to and in contact with the fuser member and external thereto such that heat energy may be transferred to the fuser member by such contact; and

a heat source for transferring heat energy to the at least one heater member.

37. The fusing apparatus of Claim 36, wherein said base cushion layer is comprised of a first polyorganosiloxane composition having a durometer hardness at 25°C of from about 35 to about 80 Shore A and said surface layer is comprised of a second polyorganosiloxane composition having a durometer hardness at 25°C of from about 20 to about 55 Shore A, the surface layer further comprising a particulate silica filler in an amount of about 10 volume percent or less, based on total volume of the surface layer.

38. The fusing apparatus of Claim 37, wherein the particulate silica filler is present in an amount of about 5 volume percent or less, based on total volume of the surface layer.

39. The fusing apparatus of Claim 38, wherein the particulate silica filler is present in an amount of about 2 volume percent or less, based on total volume of the surface layer.

40. An electrophotographic method for producing fused toner images on a receiver medium comprising the steps of:

forming an electrostatic image pattern on an image forming member;

developing the image pattern on the image forming member with fusible toner particles thereby forming a toner image thereon;

transferring the toner image to the receiver medium;

heating at least one external heater member having a contact surface thereon;

contacting the contact surface of the at least one external heater member with a fuser member comprising a core and a pliant coating on the core, the coating comprising a base cushion layer comprised of a first elastomeric composition and a surface layer comprised of a second elastomeric composition disposed over the base cushion layer, wherein the hardness of the surface layer is equal to or less

than the hardness of the base cushion layer, the contact surface of the at least one external heater member being positioned adjacent to and in contact with the surface layer of the fuser member such that a contact nip is formed therebetween and heat is transferred to the fuser member from the at least one external heater member through the contact nip; and

feeding the receiver medium bearing the toner image thereon into a fusing nip formed between the surface layer of the fuser member and a contact surface of a pressure member positioned adjacent to and in contact with the fuser member so as to form the fusing nip therebetween, the toner image being fused to the receiver medium by application of heat energy while the receiver medium is passed through the fusing nip.

41. The electrophotographic method of Claim 40, wherein the surface layer further comprises a particulate silica filler in an amount of about 10 volume percent or less, based on total volume of the surface layer, further wherein the surface layer has a durometer hardness at 25°C of from about 20 to about 55 Shore A.

42. The electrophotographic method of Claim 41, wherein the base cushion layer is comprised of a first polyorganosiloxane composition having a durometer hardness at 25°C of from about 35 to about 80 Shore A and the surface layer is comprised of a second polyorganosiloxane composition.

43. The method of Claim 40 wherein at least 50% of the heat energy necessary to fuse the toner image to the receiver medium is transferred to the fuser member by the at least one external heater member.

44. The method of Claim 40 wherein a plurality of receiver media are fed to the fusing nip at a rate of at least about 100 receiver media per minute.

45. The method of Claim 44 wherein a plurality of receiver media are fed to the fusing nip at a rate of at least 140 receiver media per minute.

46. The method of Claim 40 wherein the fuser member is a roller and the core is hollow and cylindrical.

47. The method of Claim 46 further comprising heating the fuser member by use of an internal heat source placed inside of the core.

48. The method of Claim 40 wherein the surface layer has a thickness of from about 3 to about 100 mils.

49. The method of Claim 41 wherein the surface layer further comprises a second particulate filler having a thermal conductivity of greater than about 5 Btu/(hr ft F°).

50. The method of Claim 49 wherein the second particulate filler is at least one metal oxide selected from cupric oxide, aluminum oxide, tin oxide, iron oxide, or mixtures thereof.

51. The method of Claim 49 wherein the surface layer comprises from about 5 to about 35 volume percent of the second particulate filler based on total volume of the surface layer.

52. The method of Claim 49 wherein from about 15 to 35 volume percent of the second particulate filler, based on total volume of the second particulate filler, is comprised of particles having a diameter greater than 8 microns.

53. The method of Claim 49 wherein from about 10 to about 25 volume percent of the second particulate filler, based on total volume of the second particulate filler, is comprised of particles having a diameter greater than 12 microns.

54. The method of Claim 49 wherein from about 5 to 15 volume percent of the second particulate filler, based on total volume of the second particulate filler, is comprised of particles having a diameter of greater than 20 microns.

55. The method of Claim 40 wherein the coating has an apparent hardness of from about 40 to about 75 Shore A.

56. The method of Claim 42 wherein the surface layer comprises greater than 60 volume percent of the second polyorganosiloxane, based on total volume of the surface layer.

57. The method of Claim 40 further comprising applying a polyorganosiloxane release fluid having a viscosity of greater than about 1,000 cSt at 25°C to the fuser member.

58. An electrophotographic method for producing fused toner images on a receiver medium comprising the steps of:

forming an electrostatic image pattern on an image forming member;

developing the image pattern on the image forming member with fusible toner particles thereby forming a toner image thereon;

transferring the toner image to the receiver medium;

heating a fuser member comprising a core and a pliant coating on the core, the coating comprising a base cushion layer comprised of a first elastomeric composition and a surface layer comprised of a second elastomeric composition

disposed over the base cushion layer, wherein the hardness of the surface layer is equal to or less than the hardness of the base cushion layer; and

feeding the receiver medium bearing the toner image thereon into a fusing nip formed between the surface layer of the fuser member and a contact surface of a pressure member positioned adjacent to and in contact with the fuser member so as to form the fusing nip therebetween, the toner image being fused to the receiver medium by application of heat energy while the receiver medium is passed through the fusing nip.